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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/822,923	03/30/2001	Matthew E. Frazer	PW 027 3217 P10862	8276

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EXAMINER

WANG, JIN CHENG

ART UNIT PAPER NUMBER

2672

DATE MAILED: 03/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/822,923

Applicant(s)

FRAZER ET AL.

Examiner

Jin-Cheng Wang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: On page 13, line 18, "display widow 200" should be "display window 200". On page 15, line 18, "claibration" should be "calibration". On page 16, line 3, "has been shifted". Appropriate correction of *all mistakes* is required.
2. The applicant or their representatives are urged to review the specification and submit corrections for all mistakes of a grammatical, clerical, or typographical nature.

Claim Objections

3. Claim 5 is objected to because of the following informalities: On page 31, line 2 of claim 5, "standard deviation of the pixels" should be "standard deviations of a hue of the pixels". Appropriate correction is required.
4. Claims 6 and 8 are objected to because of the following informalities: On line 1 of claims 6 and 8, "are" should be "is". Appropriate correction is required.
5. Claim 11 is objected to because of the following informalities: On line 3 of claim 11, "are greater a predetermined amount" should be "is greater than a predetermined amount". Appropriate correction is required.
6. Claim 12 is objected to because of the following informalities: On line 3 of claim 12, "pixels in the image frame are to be a part of" should be "pixels in the image frame are to be part of". Appropriate correction is required.

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7. Claim 13 is objected to because of the following informalities: On line 1 of claim 13, "The method of claim 13". It is assumed that claim 13 is dependent on claim 9 and therefore it should be changed to "The method of claim 9". Appropriate correction is required.
8. Claim 15 is objected to because of the following informalities: On line 2 of claim 15, "are" should be "is". Appropriate correction is required.
9. Claim 20 is objected to because it is the same as claim 14.

Claim Rejections - 35 USC § 112

10. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
11. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 recites the limitation "the HSV thresholding device" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim or its dependent claim.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (e) the invention was described in-
- (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

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(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

13. Claims 1-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Bradski et al.

U.S. Pat. No. 6,363,160.

14. Claim 1:

The Bradski reference teaches an automated calibration system (figure 1) for tracking a colored object through a series of frames of data (column 3, lines 34-55), comprising :

(a) A first processing device (i.e., the computer system 157) to execute a program (figure 1), wherein the program displays at least one image frame from an image input device (i.e., a camera. See column 4, lines 1-10);

(b) An image selection device to select the colored object in the at least one image frame (column 3, lines 59-67, column 4, lines 1-10, and column 7, lines 33-54);

(c) An image source device (video source 1102 of figure 11) to provide a hue saturation value (HSV) data array of pixels in the colored object (column 13, lines 45-52);

(d) A second processing device (i.e., the computer system 157 of figure 1 or the micro-processor based device 1106 of figure 11) to analyze the HSV data array, wherein the second processing device determines characteristics of the pixels in the at least one image frame that are to be associated with the object based on a probability (figures 4-5, and column 4, lines 1-57).

Claim 2:

The claim 2 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of HSV threshold device. However, the Bradski reference further discloses the claimed limitation of the HSV threshold device (column 4, lines 1-34).

Claim 3:

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The claim 3 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of a digital camera. However, the Bradski reference further discloses the claimed limitation of the digital camera (column 4, lines 1-57).

Claim 4:

The claim 4 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of a single device. However, the Bradski reference further discloses the claimed limitation of the digital camera (figure 1).

Claim 5:

The claim 5 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of the second processing device calculating a mean hue and a standard deviation of a hue of the pixels representing the colored object. However, the Bradski reference further discloses the claimed limitation of the second processing device calculating a mean hue and a standard deviation of a hue of the pixels representing the colored object (column 4, lines 2-57, column 10, lines 1-16, column 5, lines 31-63, and column 6, lines 22-44).

Claim 6:

The claim 6 encompasses the same scope of invention as that of claim 5 except additional claimed limitation of the colored object not being tracked if the mean hue or the standard deviation of the hue are less than predetermined levels. However, the Bradski reference further discloses the claimed limitation of the colored object not being tracked if the mean hue or the standard deviation of the hue are less than predetermined levels (column 4, lines 2-57, column 10, lines 1-16, column 5, lines 31-63, and column 6, lines 22-44).

Claim 7:

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The claim 7 encompasses the same scope of invention as that of claim 1 except additional claimed limitation of the second processing device calculating a mean saturation and a standard deviation of a saturation of the pixels representing the colored object. However, the Bradski reference further discloses the claimed limitation of the second processing device calculating a mean saturation and a standard deviation of a saturation of the pixels representing the colored object (column 4, lines 2-57, column 10, lines 1-16, column 5, lines 31-63, and column 6, lines 22-44).

Claim 8:

The claim 8 encompasses the same scope of invention as that of claim 7 except additional claimed limitation of the colored object not being tracked if the mean saturation or the standard deviation of the saturation is less than predetermined levels. However, the Bradski reference further discloses the claimed limitation of the colored object not being tracked if the mean saturation or the standard deviation of the saturation is less than predetermined levels (column 4, lines 2-57, column 10, lines 1-16, column 5, lines 31-63, and column 6, lines 22-44).

15. Claim 9:

The Bradski reference teaches a method of calibrating a computer-vision system (figure 1) to track a colored object through a series of frames of data (column 3, lines 34-55), comprising :

- (a) Executing a program a program (figure 1) to display at least one image frame from an image input device (i.e., a camera. See column 4, lines 1-10);
- (b) Providing a calibration selection device to select the colored object in the at least one image frame (column 3, lines 59-67, column 4, lines 1-10, and column 7, lines 33-54);

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(c) Performing calibration processing to ensure the object selected is trackable throughout the series of frames (video source 1102 of figure 11), wherein the calibration processing analyzes pixel data of the object (column 13, lines 45-52); and

(d) Creating a table from the pixel data for the object (figure 4).

Claim 10:

The claim 10 encompasses the same scope of invention as that of claim 9 except additional claimed limitation of converting a pixel data array for the at least one image frame from a red-green-blue colorspace (RGB) data array to a hue-saturation-value colorspace (HSV) data array. However, the Bradski reference further discloses the claimed limitation of converting a pixel data array for the at least one image frame from a red-green-blue colorspace (RGB) data array to a hue-saturation-value colorspace (HSV) data array (column 4, lines 1-57).

Claim 11:

The claim 11 encompasses the same scope of invention as that of claim 9 except additional claimed limitation of applying the pixel data from an entire frame to the pixel-classification look-up map wherein if the amount of the pixels associated with the object is greater than a predetermined amount, the calibration method restarts. However, the Bradski reference further discloses the claimed limitation of applying the pixel data from an entire frame to the pixel-classification look-up map wherein if the amount of the pixels associated with the object is greater than a predetermined amount, the calibration method restarts (figure 4).

Claim 12:

The claim 12 encompasses the same scope of invention as that of claim 9 except additional claimed limitation of determining which of the pixels in the image frame being part of

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the colored object selected based on a probability. However, the Bradski reference further discloses the claimed limitation of determining which of the pixels in the image frame being part of the colored object selected based on a probability (figures 4-5).

Claim 13:

The claim 13 encompasses the same scope of invention as that of claim 9 except additional claimed limitation of thresholding the HSV data array of pixels in the colored object. However, the Bradski reference further discloses the claimed limitation of thresholding the HSV data array of pixels in the colored object (column 4, lines 1-57).

Claim 14:

The claim 14 encompasses the same scope of invention as that of claim 10 except additional claimed limitation of calculating a mean hue and a standard deviation of a hue of the pixels in the colored object. However, the Bradski reference further discloses the claimed limitation of calculating a mean hue and a standard deviation of a hue of the pixels in the colored object (column 4, lines 2-57, column 10, lines 1-16, column 5, lines 31-63, and column 6, lines 22-44).

Claim 15:

The claim 15 encompasses the same scope of invention as that of claim 10 except additional claimed limitation of restarting the calibration method if the mean hue or the standard deviation of the hue is less than predetermined levels. However, the Bradski reference further discloses the claimed limitation of restarting the calibration method if the mean hue or the standard deviation of the hue is less than predetermined levels (column 4, lines 2-57, column 10, lines 1-16, column 5, lines 31-63, and column 6, lines 22-44).

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Claim 16:

The claim 16 encompasses the same scope of invention as that of claim 10 except additional claimed limitation of calculating a mean saturation and a standard deviation of a saturation of the pixels representing the colored object. However, the Bradski reference further discloses the claimed limitation of calculating a mean saturation and a standard deviation of a saturation of the pixels representing the colored object (column 4, lines 2-57, column 10, lines 1-16, column 5, lines 31-63, and column 6, lines 22-44).

Claim 17:

The claim 17 encompasses the same scope of invention as that of claim 16 except additional claimed limitation of restarting the calibration method if the mean saturation or the standard deviation of the saturation is less than predetermined levels. However, the Bradski reference further discloses the claimed limitation of restarting the calibration method if the mean saturation or the standard deviation of the saturation is less than predetermined levels (column 4, lines 2-57, column 10, lines 1-16, column 5, lines 31-63, and column 6, lines 22-44).

Claim 18:

The claim 18 encompasses the same scope of invention as that of claim 10 except additional claimed limitation of allowing the user to select the colored object. However, the Bradski reference further discloses the claimed limitation of allowing the user to select the colored object (column 4, lines 1-57).

Claim 19:

The claim 19 encompasses the same scope of invention as that of claim 10 except additional claimed limitation of a pixel classification look-up map. However, the Bradski

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reference further discloses the claimed limitation of a pixel classification look-up map (figures 4-5).

Claim 20:

The claim 20 encompasses the same scope of invention as that of claim 14. The claim is subject to the same reason given in claim 14.

Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Darrel et al. U.S. Pat. No. 6,445,810 discloses techniques from computer vision and computer graphics to robustly track a target.

b. Matey et al. U.S. Pat. No. 5,649,021 discloses a color detector processing the imager signals to detect a range of colors in the image represented by the imager signals.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (703) 605-1213. The examiner can normally be reached on 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on (703) 305-4713. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-6606 for regular communications and (703) 308-6606 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 395-3900.

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jcw
February 19, 2003



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